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Optical and Magnetic Properties of YBCO
Related Structures

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Magnetism in $(\text{Pr}_{1.5}\text{Ce}_{0.5})\text{Sr}_2\text{Cu}_2\text{Nb}_{1-x}\text{Ta}_x\text{O}_{10}$ ^{*} --M. J. MCINTYRE,² M. J. BENNAHMIA^{1,3} T.J. GOODWIN,² C. C. HOELLWARTH², A. F. BELLO,^{1,3} C. M. BUFORD,⁴ A. KEBEDE,⁴ R.N. SHELTON,² AND H.B. RADOUSKY,^{1,2}
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 $(\text{Pr}_{1.5}\text{Ce}_{0.5})\text{Sr}_2\text{Cu}_2\text{NbO}_{10}$ (PrCeSCNO) is an insulating analog to RCeSCNO (R = Nd, Sm and Eu), which have superconducting T_c 's near 28 K. The structure is similar to $\text{PrBa}_2\text{Cu}_3\text{O}_7$ (PrBCO), where Sr replaces Ba, the CuO chains are replaced by NbO₂ planes, and the rare earth site is replaced by a R₂O₂ fluorite structure. PrCeSCNO displays two magnetic ordering transitions, near 15 K and 50 K, which are not observed for the Nd, Sm or Eu based materials. When Ta replaces Nb, the structure remains the same, but the magnetic ordering peak at 50 K is not observed for the PrCeSCTO material. A series of intermediate samples $(\text{Pr}_{1.5}\text{Ce}_{0.5})\text{Sr}_2\text{Cu}_2\text{Nb}_{1-x}\text{Ta}_x\text{O}_{10}$ have been prepared, and results of the specific heat and irreversible behavior of the magnetization as the Nb/Ta ratio is varied will be presented. The origin of the 50 K magnetic ordering peak, and its disappearance with Ta addition, will be discussed. ^{*}Work at LLNL, UCD and NCA&T was supported in part by the LLNL Res. Collab. Program for Historically Black Colleges and Univ. under the

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